March 1938

UNITED STATES
DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, SECRETARY

BUREAU OF MINES
JOHN W. FINCH, DIRECTOR

INFORMATION CIRCULAR

MARKETING MICA

RECEIVED
[illegible]
O. S. U. LIBRARY

BY

PAUL M. TYLER

AFTER THIS REPORT HAS SERVED YOUR PURPOSE AND IF YOU HAVE NO FURTHER NEED FOR IT, PLEASE RETURN IT TO THE BUREAU OF MINES, USING THE OFFICIAL MAILING LABEL ON THE INSIDE OF THE BACK COVER.

I. C. 6997,
March 1938.

INFORMATION CIRCULAR

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

MARKETING MICA[1]

By Paul M. Tyler[2]

The value of mica depends chiefly upon the size of the flat sheets into which it can be split and also upon whether it is clear or stained. Muscovite (white mica) and phlogopite (amber mica) are the micas of commerce. Biotite (black mica) and other varieties are virtually unsalable. Vermiculite, an altered mica having the extraordinary property of expanding greatly when heated, preferably should not be classed commercially as mica. Mica is marketed as (1) cut or uncut block, (2) sheet, (3) splittings, and (4) wet or dry ground mica.

In the United States, mica that will not yield flat films over about 1-1/2 inches square, or that is ruled, rumpled, or flawed in any way, can be sold only as scrap, its sole use being for making ground mica. Only sizes that will yield rectangles 1-1/2 by 2 inches or larger can be classed as sheet quality; slightly smaller sizes may be classed as punch, and under certain circumstances still smaller sizes, down to about 1 inch square, may be used for splittings, which are mostly a thousandth of an inch thick or even thinner. Splittings, however, are produced in large quantities only in British India, where labor costs very little. Even there the work is done mostly by children, who not only work cheaper but have a delicacy of touch that enables them to do the splitting faster and better. No mechanical process yet devised will permit ordinary splittings to be made economically in the United States.

A great deal of apparently good, large mica is ruined by rumpling and distortion of the crystals or "books." Tangle-sheet mica splits imperfectly; ruled mica splits in ribbons across the regular cleavage planes; and wedge mica yields films that are thicker at one end than at the other. Spotted or stained mica contains thin scales or streaks of dark minerals, such as iron oxides, and is worth less than clear, transparent mica, even though for some purposes its usefulness is not greatly impaired. Clay-staining usually occurs only near the surface, the mica books being opened slightly by weathering, thereby admitting soil between the laminae, which often renders the mica useless even as scrap. Air-bells may ruin mica for use as sheets, unless the air can be removed by careful splitting.

---

[1] The Bureau of Mines will welcome reprinting of this paper provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Information Circular 6997."

[2] Chief engineer, Nonmetal Economics Division, Bureau of Mines.

Grading. - The small mica miner can scarcely hope to know how to appraise the value of his product, and ordinarily his appraisal would not be accepted by large buyers, who know exactly what they want. The product of any mine is mixed and contains many grades (sizes) and classes (qualities) in ever varying proportions. Even if universally accepted standards did exist with respect to certain grades and classes (which is not the case), there would still be opportunity for a difference of opinion as to the value of a mixed lot, some portions of which would yield sizes that were in active demand while other portions would not be wanted at the moment. Ordinarily, the better prepared the product, the better the price that will be paid, partly for the reason that the product can be appraised more readily. On the other hand, much good mica can be spoiled by improper trimming or rifting, an experienced worker often being able to salvage a great deal of punch or even sheet sizes from material that others would classify only as waste. Trained judgment is essential, particularly when it comes to trimming out defects in rifted material; irregular pieces are likely to be worth more than the largest rectangle that could be obtained from them by close trimming. The complexity of the grading and classifying is indicated by the fact that there are fully 100 distinct products; A.S.T.M. designation D 351-33T recognizes six different qualities for each size - namely, clear, clear and slightly stained, fair stained, good stained, stained, and black stained or spotted - and intermediate classifications can be distinguished.

The following operations are performed in preparing mica for sale: (1) Cobbing and cleaning the books; (2) rifting or splitting into sheets thin enough to be cut by hand with a blade, say 0.01 to 0.04 inches thick; (3) trimming (Bengal mica is "sickle-trimmed", resulting in an irregular outline and beveled edge, Madras mica is trimmed with a knife or guillotine, and mica from other countries is trimmed with knife, shears, or thumb); (4) grading by size; (5) classifying each size by quality; and (6) splitting to the desired final thickness, usually one mil (0.001 inch).

Production and consumption. - Although the United States is the world's largest consumer of mica, it produces normally only 15 to 35 percent of its requirements of sheet mica and less than 5 percent of its requirements of splittings. Domestic mines furnish almost enough punch and circle sizes, but the bulk of their yield is scrap. A good deal of finely divided mica is recovered as a byproduct of clay washing, further quantities are obtained from schists, and some scrap or waste mica is imported for grinding. Our principal importation is splittings, of which we consumed 3,500,000 pounds in 1936, about 90 percent coming from British India and the balance from Madagascar and Canada. Domestic production of sheet mica in 1936 was 1,319,233 pounds, but only 300,773 pounds was larger than punch or circle. Imports of sheet mica aggregated less than 1,000,000 pounds, but consisted principally of larger sizes. Production of ground mica in the United States in 1936 reached an all-time record, amounting to 23,418 short tons. At present domestic mica is mined principally in North Carolina, New Hampshire, and Connecticut, but supplies are obtained from Alabama, Georgia, South Carolina, New Mexico, South Dakota, Virginia, and other States.

Uses. - The electrical industry is the principal consumer of sheet mica and splittings. However, the quantities used for stove windows, lantern chimneys, furnace peepholes, and nonbreakable goggles and sundry decorative uses are not insignificant. Ground mica is used mainly in roll roofing, although substantial quantities are consumed in making wall paper, paint, and rubber goods; miscellaneous uses include surfacing asphalt shingles, Christmas-tree snow, lubricants, annealing, concrete surfacing, foundry facings, pipeline enamels, plastic specialties, and others.

Prices. - The Engineering and Mining Journal (New York) regularly quotes various classes of mica, but any trade-journal quotations for domestic mica must necessarily be nominal inasmuch as prices must be determined chiefly by negotiation between buyer and seller on a given lot of material. Even with respect to well-standardized Indian mica, there is some latitude for price variation with respect to nominally similar grades. Reports of producers to the Bureau of Mines indicate that in 1936 waste or scrap mica was worth, on the average, $12.44 per short ton at the mines, and waste from some mines has sold as low as $6. Ground mica has sold for from about $12 a ton for byproduct or low-grade dry-ground material to over $100 for better qualities of clean, wet-ground mica, the average in 1936 for dry-ground mica being $21.97 and for wet-ground, $55.46 per ton. Punch and circle mica averaged 5 cents a pound, and for the larger sheet mica the average was 52 cents. For uncut sheet mica 2 by 2 inches, the price was from 30 to 50 cents; for 3- by 3-inch it was around 50 to 65 cents; and so on up to $3.50 to $5 a pound for 8- by 10-inch size. The effect of staining on price is illustrated in respect to high-grade Indian ruby #5 (3 to 6 square inches in area), which in 1935 was listed by dealers in the United States as worth $2.14 per pound for clear or slightly stained, $1.69 for fair stained, $1.47 for good stained, $0.54 for stained, and $0.33 for black-spotted. A similar grade of New England clear mica was listed at $1.20, and larger or smaller discounts were placed on mica from other sources, such as Brazil or Rhodesia. Generally speaking, Indian ruby mica, grade for grade and class for class, sells for higher prices per pound than other kinds of foreign or domestic mica. During 1936 Indian splittings brought from 10 cents to $1.20 a pound.

Buyers. - The following firms have indicated to the Bureau of Mines that they are buyers of mica of the kinds specified:

BUYERS OF MICA

Waste or Scrap

CALIFORNIA
  Pacific Minerals Co., Ltd., Richmond.
GEORGIA
  Frank Smith, Cartersville.
ILLINOIS
  Amalgamated Roofing Co., 6600 Central Ave., Clearing.
  United States Gypsum Co., Chicago.
MASSACHUSETTS
  Huse-Liberty Mica Co., 171 Camden St., Boston.
NEW HAMPSHIRE
  New Hampshire Mica & Mining Co., Keene.
NEW YORK, NEW YORK CITY
  Barclay Chemical Co., Inc., 75 "A" Varick St.
  English Mica Co., 220 East 42nd St.
  General Mineral Co., 96-104 Spring St.
  Minerals & Insulation Corporation, 135 Prince St.
  Eugene Munsell & Co., 200 Varick St.
  A. O. Schoonmaker Insulation Co., Inc., 345 Hudson St.
  Soeldner-Heyman Co., Inc., 149 Church St.
  Varlacoid Chemical Co., 116 Broad St.
NORTH CAROLINA
  Asheville Mica Co., Biltmore.
  Franklin Mineral Products Co., Franklin.
  Carolina China Clay Co., Penland.
  General Mica Co., Penland.
  Penland Feldspar & Kaolin Co., Penland.
  D. T. Vance, Plumtree.
OHIO
  Gilbert H. Downey, The Westlake, Cleveland.
VIRGINIA
  F. G. Hoffman, Claremont.
  Richmond Mica Co., Richmond.
WISCONSIN
  W. E. Krause Co., 8136 Milwaukee Ave., Wauwatosa.

Punch or Circle

ILLINOIS
  American Mica Products Co., 313 W. Chestnut St., Chicago.
  United States Gypsum Co., Chicago.
MASSACHUSETTS
  Huse-Liberty Mica Co., 171 Camden St., Boston.
NEW HAMPSHIRE
  New Hampshire Mica & Mining Co., Keene.

Original from THE OHIO STATE UNIVERSITY

NEW YORK

BROOKLYN

Ford Radio & Mica Corporation, 832 4th Ave.
Industrial Mica Corporation, 730 64th St.
Reliance Mica Co., 342 39th St.

NEW YORK CITY

William Brand & Co., 276 4th Ave.
General Mineral Co., 96-104 Spring St.
Otto Gerdau Co., 533 Canal St.
Gillespie Rogers Pyatt Co., Inc., 80 John St.
Mica Insulator Co., 200 Varick St.
Minerals & Insulation Corporation, 135 Prince St.
Eugene Munsell & Co., 200 Varick St.
A. O. Schoonmaker Insulation Co., Inc., 345 Hudson St.
Soeldner-Heyman Co., Inc., 149 Church St.
Varlacoid Chemical Co., 116 Broad St.

NORTH CAROLINA

Asheville Mica Co., Biltmore.
Carolina China Clay Co., Penland.
Penland Feldspar & Kaolin Co., Penland.
Spruce Pine Mica Co., Inc., Spruce Pine.

OHIO

Gilbert H. Downey, The Westlake, Cleveland.

Uncut Sheet or Block

GEORGIA

Frank Smith, Cartersville.

ILLINOIS

American Mica Products Co., 313 W. Chestnut St., Chicago.
Robert K. Preston Mica Co., 53 W. Jackson St., Chicago.

MASSACHUSETTS

Huse-Liberty Mica Co., 171 Camden St., Boston.
The Macallen Co., 61 Macallen St., Boston.

NEW HAMPSHIRE

New Hampshire Mica & Mining Co., Keene.

NEW JERSEY

Colonial Mica Co., 26 Exchange Place, Jersey City.

NEW YORK

Ford Radio & Mica Corporation, 832 4th Ave., Brooklyn.
Industrial Mica Corporation, 730 64th St., Brooklyn.

NEW YORK CITY

American Mica Works, 49 West St.
William Brand & Co., 276 4th Ave.
Brazilian Trading Co., Inc., 377 4th Ave.
General Mineral Co., 96-104 Spring St.
Otto Gerdau Co., 533 Canal St.
Mica Insulator Co., 200 Varick St.
Minerals & Insulation Corporation, 135 Prince St.
Mitchell-Rand Manufacturing Co., 51 Murray St.

NEW YORK (Cont'd)

NEW YORK CITY (Cont'd)

Eugene Munsell & Co., 200 Varick St.
A. O. Schoonmaker Insulation Co., Inc., 345 Hudson St.
Soeldner-Heyman Co., Inc., 149 Church St.
Varlacoid Chemical Co., 116 Broad St.

NORTH CAROLINA

Asheville Mica Co., Biltmore.
Carolina China Clay Co., Penland.
Penland Feldspar & Kaolin Co., Penland.
Spruce Pine Mica Co., Inc., Spruce Pine.

OHIO

Gilbert H. Downey, The Westlake, Cleveland.

PENNSYLVANIA

Rodale Manufacturing Co., Emaus.

VIRGINIA

F. G. Hoffman, Claremont.

Cut

ILLINOIS

Robert K. Preston Mica Co., 53 West Jackson St., Chicago.
United States Gypsum Co., Chicago.

NEW HAMPSHIRE

New Hampshire Mica & Mining Co., Keene.

NEW JERSEY

Colonial Mica Co., 26 Exchange Place, Jersey City.

NEW YORK

BROOKLYN

Industrial Mica Corporation, 730 64th St.
Reliance Mica Co., 342 39th St.

NEW YORK CITY

American Mica Works, 49 West St.
William Brand & Co., 276 4th Ave.
Brazilian Trading Co., Inc., 377 4th Ave.
General Mineral Co., 96-104 Spring St.
Otto Gerdau Co., 533 Canal St.
Gillespie Rogers Pyatt Co., Inc., 80 John St.
Mica Insulator Co., 200 Varick St.
Minerals & Insulation Corporation, 135 Prince St.
Mitchell-Rand Manufacturing Co., 51 Murray St.
Eugene Munsell & Co., 200 Varick St.
A. O. Schoonmaker Insulation Co., Inc., 345 Hudson St.
Soeldner-Heyman Co., Inc., 149 Church St.
Varlacoid Chemical Co., 116 Broad St.

NORTH CAROLINA

Asheville Mica Co., Biltmore.

OHIO

Gilbert H. Downey, The Westlake, Cleveland.

PENNSYLVANIA

Rodale Manufacturing Co., Emaus.

VIRGINIA

F. G. Hoffman, Claremont.

WISCONSIN

W. E. Krause Co., 8136 Milwaukee Ave., Wauwatosa.

Ground

GEORGIA

Frank Smith, Cartersville,

ILLINOIS

A. Daigger & Co., 161 West Kinzie St., Chicago.
United States Gypsum Co., Chicago.
Amalgamated Roofing Co., 6600 Central Ave., Clearing.

MASSACHUSETTS

Fisk Rubber Co., Chicopee Falls.

NEW YORK

John A. Wiener, 81 West 7th St., Oswego.

NEW YORK CITY

American Cyanamid & Chemical Corporation, 30 Rockefeller Plaza.
Barclay Chemical Co., Inc., 75 "A" Varick St.
Stanley Doggett, Inc., 473 Canal St.
General Mineral Co., 96-104 Spring St.
Mica Insulator Co., 200 Varick St.
Minerals & Insulation Corporation, 135 Prince St.
William H. Scheel, Inc., Water & John Sts.
A. O. Schoonmaker Insulation Co., Inc., 345 Hudson St.
Wishnick-Tumpeer, Inc., 295 Madison Ave.

NORTH CAROLINA

Asheville Mica Co., Biltmore.
Carolina China Clay Co., Penland.
General Mica Co., Penland.
Penland Feldspar & Kaolin Co., Penland.

OHIO

Natl. Sales Corporation, 31-35 East 13th St., Cincinnati.
Gilbert H. Downey, The Westlake, Cleveland.
Harshaw Chemical Co., 1933 East 97th St., Cleveland.
Weaver Wall Co., Brookpark & State Roads, Cleveland.

WISCONSIN

W. E. Krause Co., 8136 Milwaukee Ave., Wauwatosa.

Splittings

GEORGIA

Frank Smith, Cartersville.

ILLINOIS

Robert K. Preston Mica Co., 53 West Jackson St., Chicago.
United States Gypsum Co., Chicago.

INDIANA

Continental-Diamond Fibre Co., Valparaiso.

Original from THE OHIO STATE UNIVERSITY

MASSACHUSETTS

The Macallen Co., 61 Macallen St., Boston.
New England Mica Co., Waltham.

NEW HAMPSHIRE

New Hampshire Mica & Mining Co., Keene.

NEW YORK

Mica Company of Canada, Inc., Massena.

BROOKLYN

Industrial Mica Corporation, 730 64th St.
Reliance Mica Co., 342 39th St.
American Mica Works, 49 West St.

NEW YORK CITY

William Brand & Co., 276 4th Ave.
General Mineral Co., 96-104 Spring St.
Otto Gerdau Co., 533 Canal St.
Gillespie Rogers Pyatt Co., Inc., 80 John St.
Mica Insulator Co., 200 Varick St.
Minerals & Insulation Corporation, 135 Prince St.
Eugene Munsell & Co., 200 Varick St.
A. O. Schoonmaker Insulation Co., Inc., 345 Hudson St.
Soeldner-Heyman Co., Inc., 149 Church St.
Varlacoid Chemical Co., 116 Broad St.

NORTH CAROLINA

Asheville Mica Co., Biltmore.
Penland Feldspar & Kaolin Co., Penland.
Tar Heel Mica Co., Plumtree.
D. T. Vance, Penland.

OHIO

Gilbert H. Downey, The Westlake, Cleveland.

WISCONSIN

Allis-Chalmers Manufacturing Co., Milwaukee.